

# WTX System Design Guide

Rev 0.5

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Preliminary

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## 1.0 Guide Overview

This design guide is a work in progress. The goal of this guide is to provide a complete set of documentation required for manufacturing a WTX-compliant chassis. It will also contain advice and information on alternate WTX designs.

The design depicted here is still in development. Therefore, information is presented as an overview intended to give guide users a familiarity with the design. As work progresses, this guide will be updated frequently to provide the most current and accurate information. All information provided in this guide is subject to change without notice.

This guide is organized in two parts. Chapter 2.0 provides information on the basic chassis, while Chapter 3.0 focuses on an integrated system. The structure of this guide may change as more information becomes available.

Figure 1 illustrates the WTX system detailed within this guide. The bezel not shown as it is still under development. The target outer dimensions for this system are 17½" high by 23½" deep by 10" wide [450 x 500 x 250 mm] with bezel and skins.

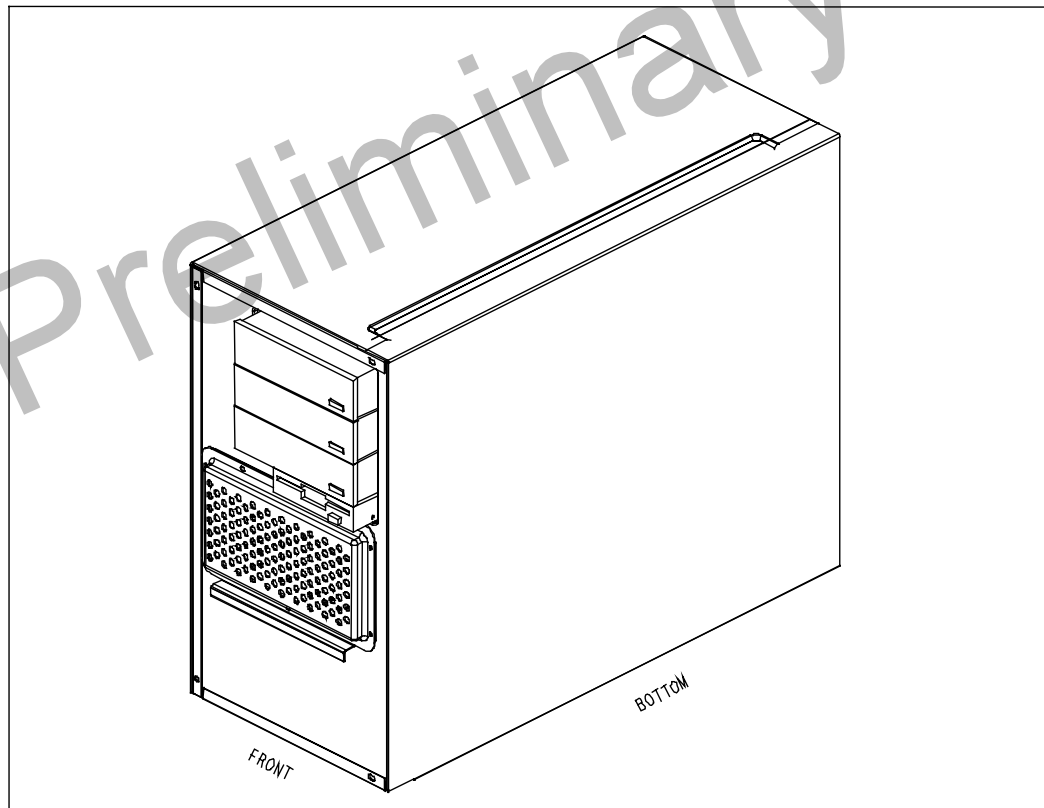


Figure 1: WTX System

## 2.0 Chassis

The chassis is the basic sheetmetal and associated plastic components that provide structure and electromagnetic containment for the system. It does not include the bezel. This chapter is organized in a bottom-up sequence, beginning with the basic chassis components and progressing through the final product ready for system integration. Figure 2 shows an isometric view of the chassis. The exterior panels have been removed to show internal features.

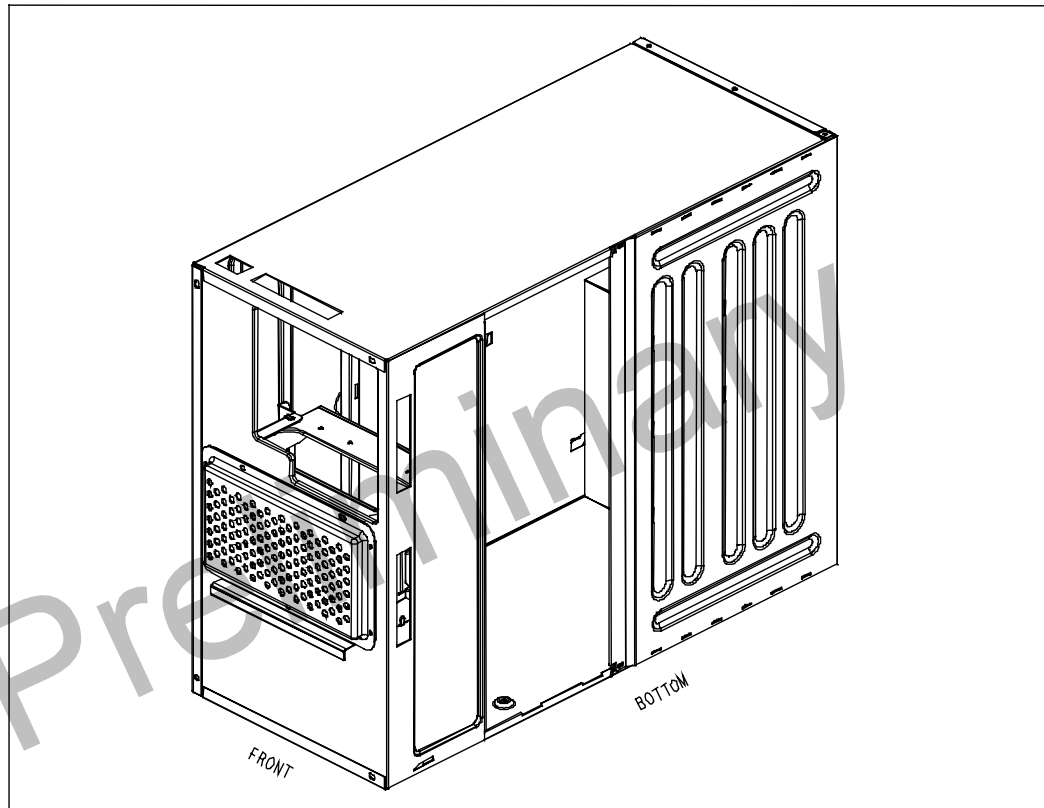


Figure 2: Chassis

## 2.1 Chassis Sub-Assembly

The chassis sub-assembly is the basic shell of the chassis. It consists of the base, front, and rear pieces and forms five sides of the box. Figure 3 shows an isometric view of the chassis sub-assembly. These three pieces are permanently attached together through spot-welding, press-fit, or riveting.

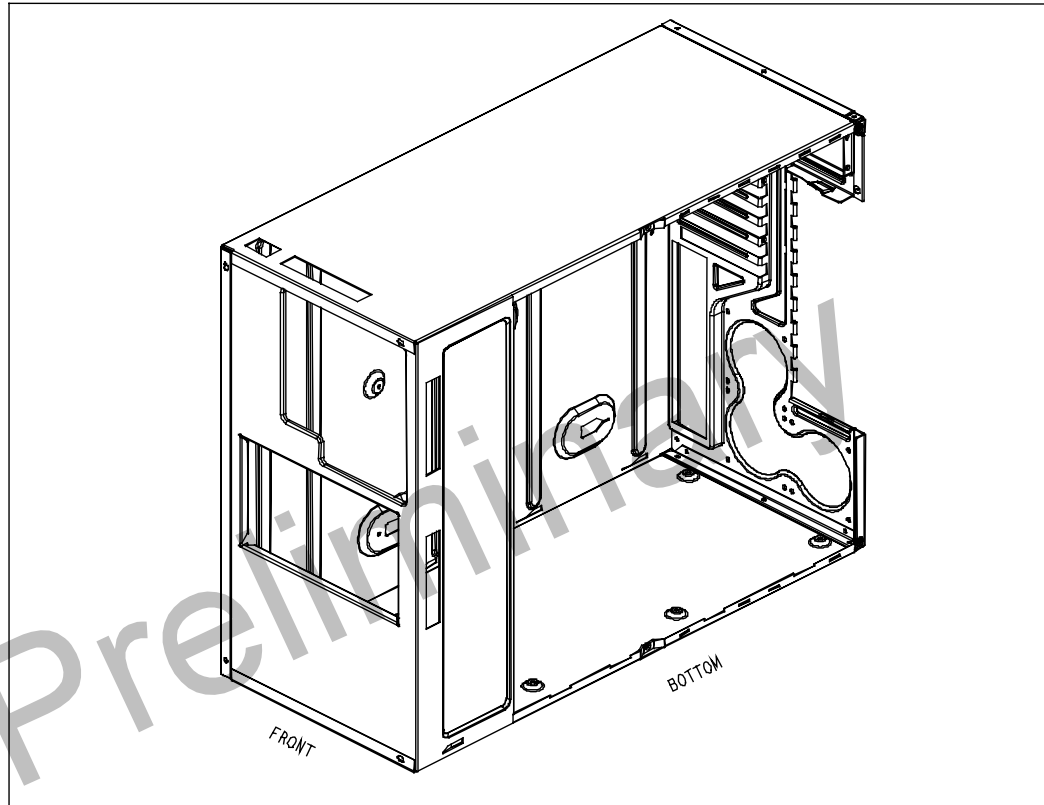


Figure 3: Chassis Sub-Assembly

### 2.1.1 Chassis Base

The chassis base is the single most important part in the chassis. It provides primary support for the board assembly and is the common part most other pieces attach to. The base forms three of the internal chassis sides. Figure 4 shows an isometric view and three plan views of the chassis base.

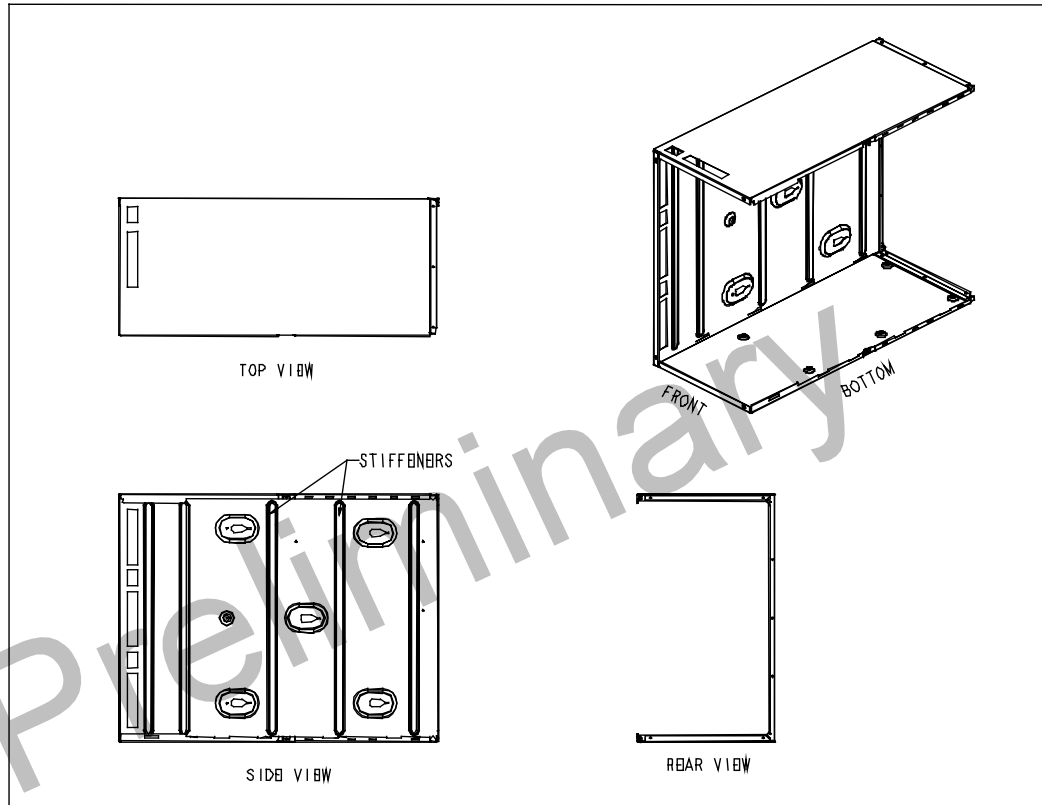
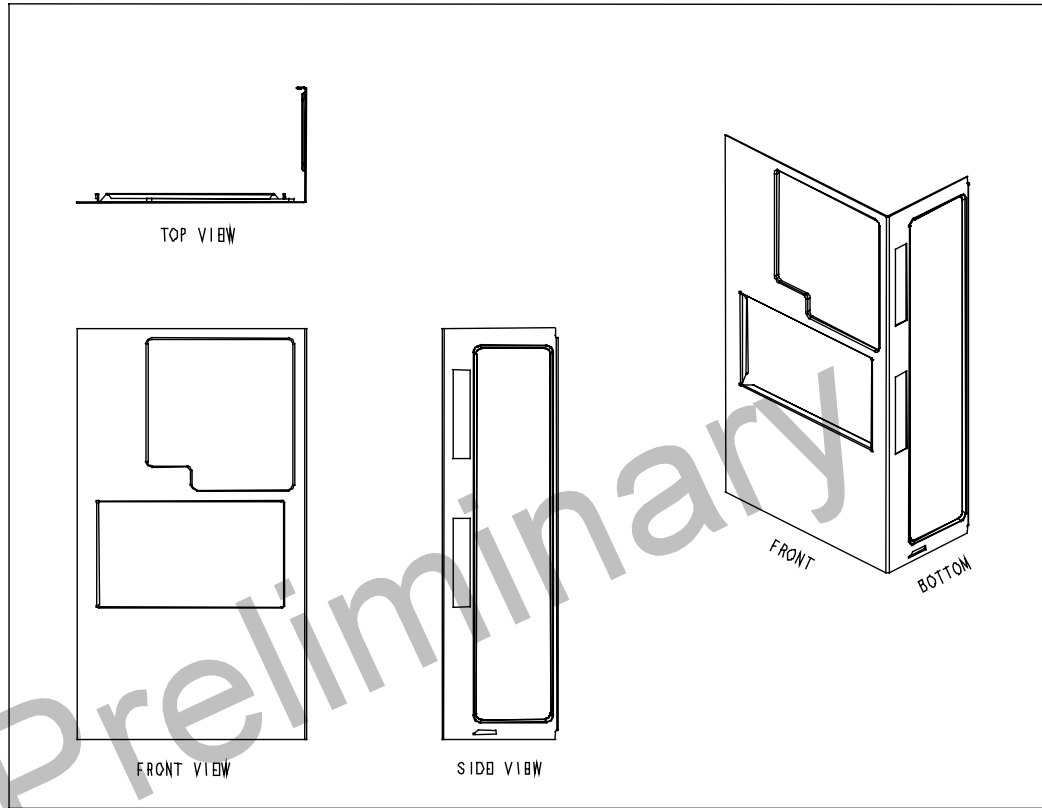


Figure 4: Chassis Base

Of particular note are the five (5) slotted forms and three threaded holes which receive the adapter plate. Also visible in the side view are three holes to establish the WTX common datum planes and several stiffening ribs. The bottom plane has the five (5) required holes set on forms.

### 2.1.2 Chassis Front

The chassis front forms the mounting plane for the drives, bezel, and two cooling fans. It is also a key structural piece. Figure 5 shows an isometric view and three plan views of the chassis front.



Venting patterns along the bottom surface are required, but not yet defined. See Section 3.3 for information on system fan placement.

### 2.1.3 Chassis Rear

The chassis rear is a complex part providing many functions. It has the required openings for motherboard I/O, expansion cards, and Flex Slot; it provides the power supply hinge and support; and it mounts three (3) system fans. It also provides the rear screw holes to lock down the adapter plate. Due to the complexity of this part, it has been designed for drawn steel. Figure 6 shows an isometric view and three plan views of the chassis rear.

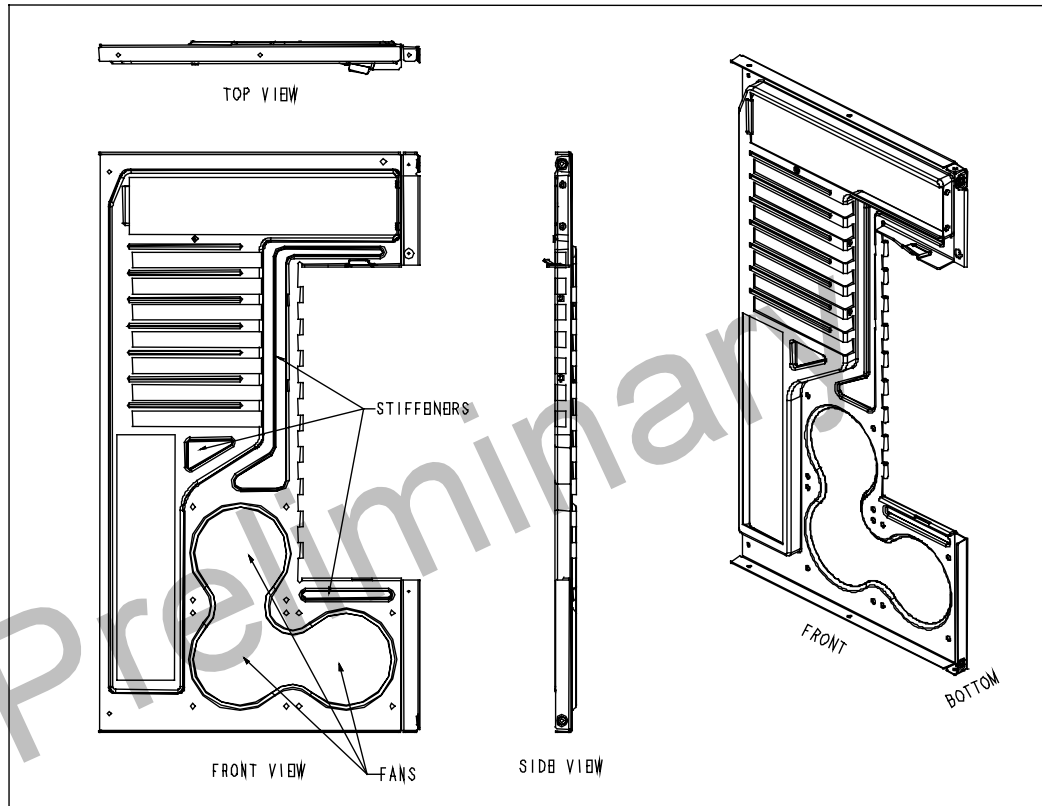


Figure 6: Chassis Rear

Note the offset between the plane of the motherboard I/O shield and the chassis rear panel per the WTX specification.



## 2.2 Power Supply Assembly

The power supply assembly mounts the power supply in the chassis and swings it out of the way for system access. Packaging constraints drove the power supply to be suspended above the board-set. In order to gain access without having to remove the power supply, it has been hinged along the rear edge. The assembly swings up 95°. Figure 7 shows an exploded view of the power supply assembly with set of plan views of the power supply bracket. This bracket screw into the forward face of the power supply to provide an set of tabs which engage slots in the carrier.

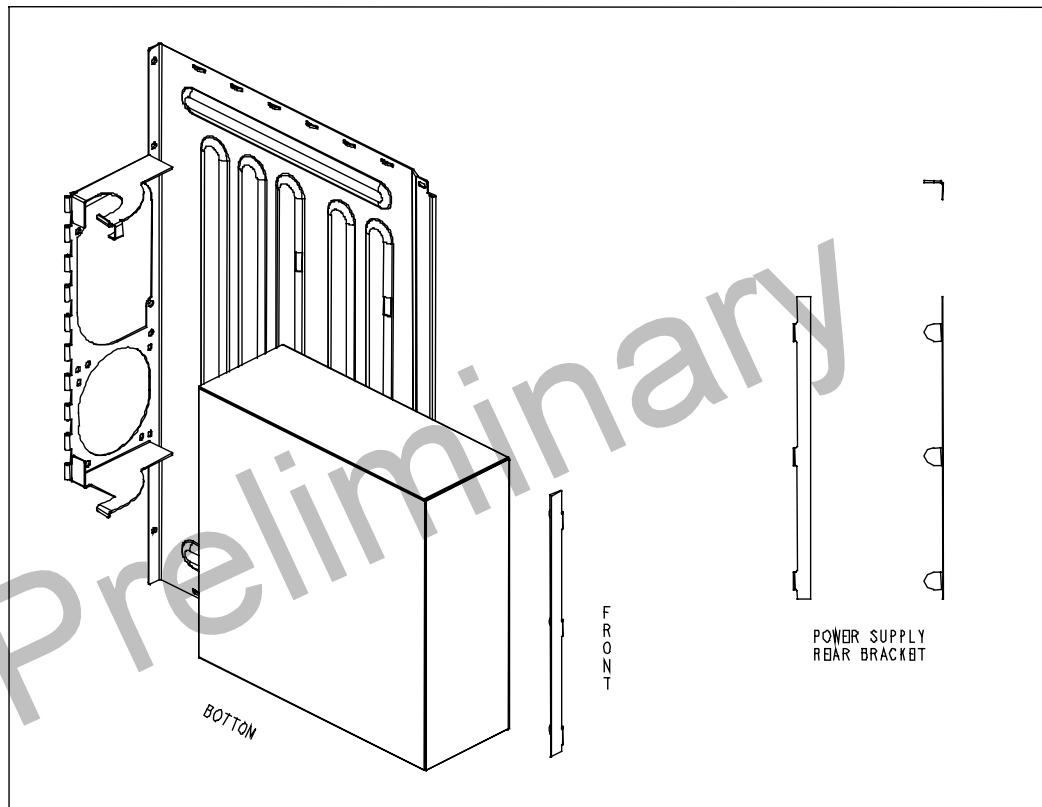


Figure 7: Power Supply Assembly – Exploded

Figure 13 showing the power supply assembly in the open position may be found in Section 3.1.

### 2.2.1 Power Supply Carrier

The power supply carrier supports the power supply and provides the hinge. It also has latching mechanisms or features to hold the power supply assembly in both open and closed positions. Figure 8 shows an isometric view and three plan views of the power supply carrier.

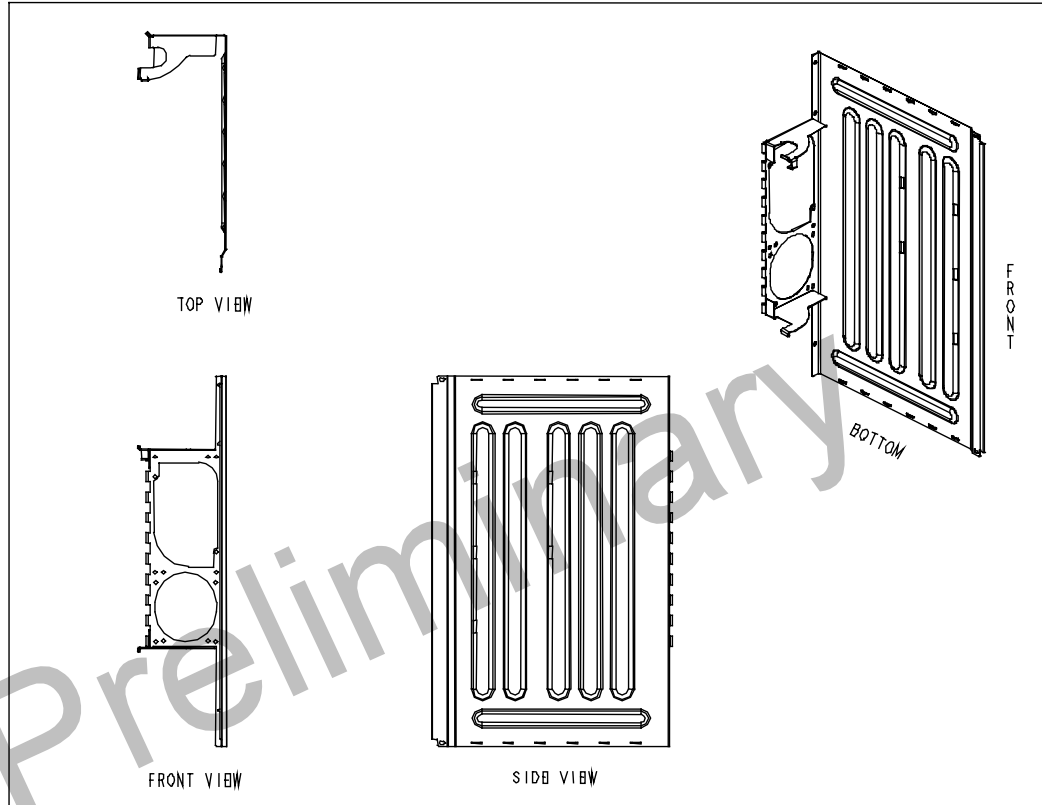


Figure 8: Power Supply Carrier

## 2.3 Hard Drive Assembly

The hard drive assembly holds a combination of up to five (5) half-height 3½" hard drives or three (3) full-height 3½" hard drives in a single package. This assembly slides in and out of the chassis on carrier brackets secured to the chassis front. Figure 9 shows the hard drive carrier pulled free of the carrier brackets, which are shown mounted inside a phantom chassis.

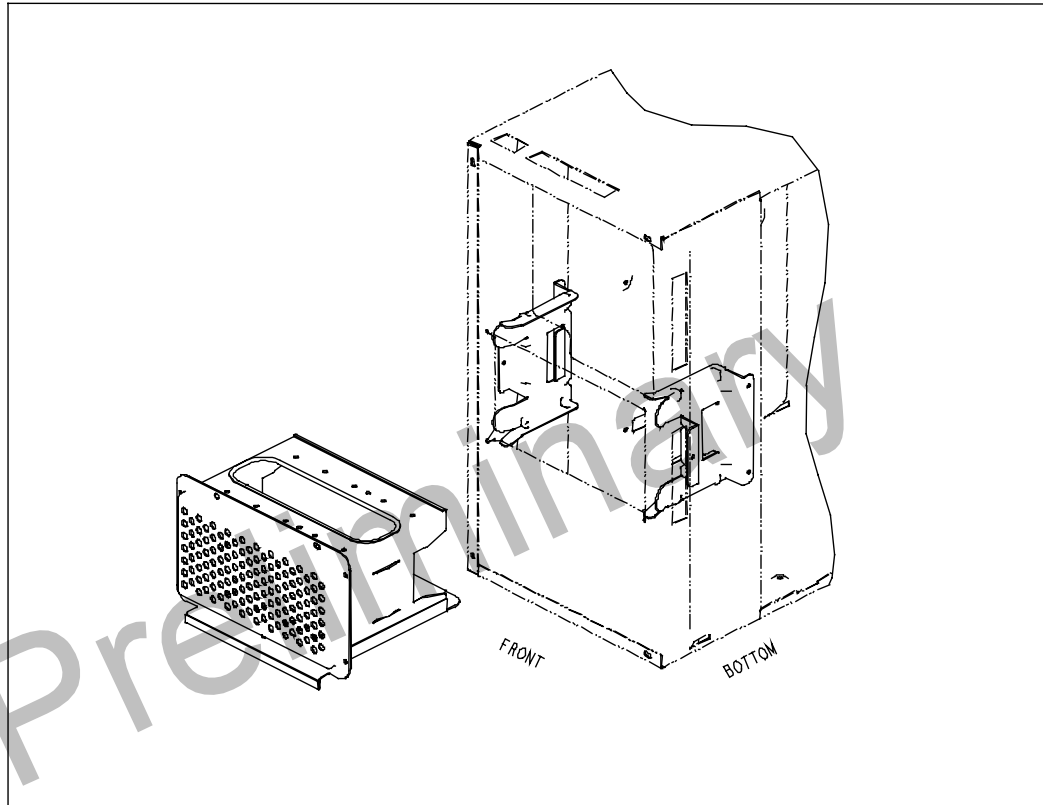


Figure 9: Hard Drive Assembly – Exploded

### 2.3.1 Hard Drive Carrier

The hard drive carrier physically mounts the hard drives. The drives are not individually serviceable inside the system. Figure 10 shows an isometric view and three plan views of the hard drive carrier

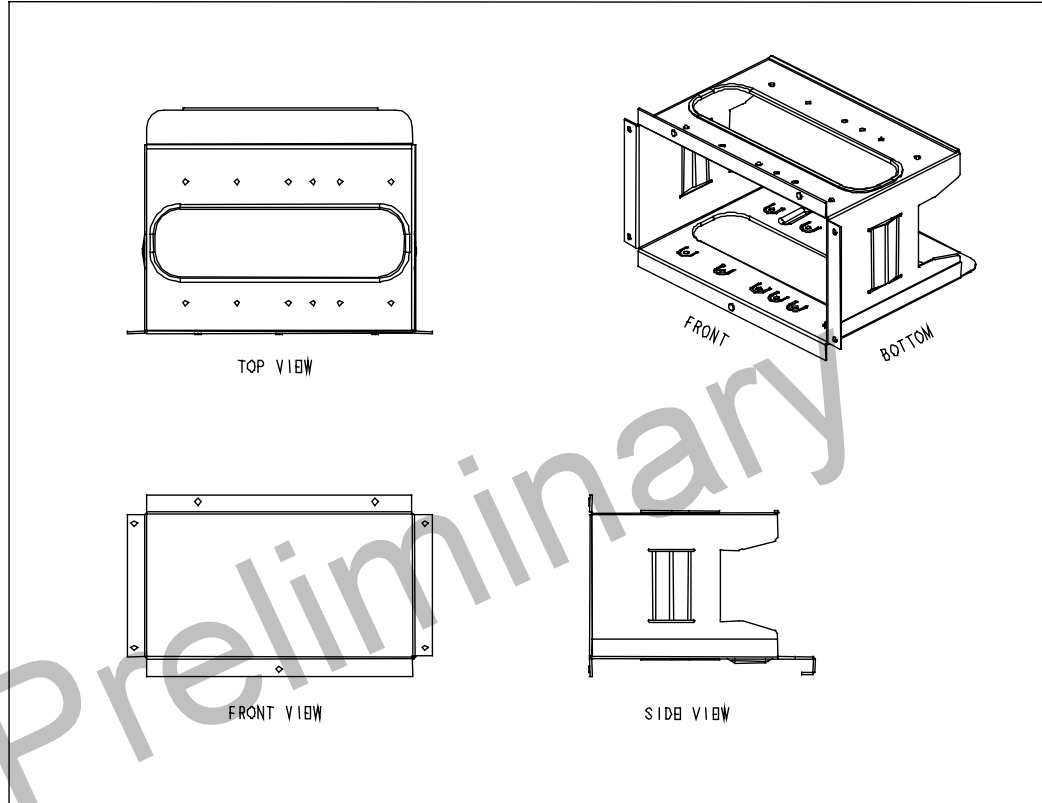


Figure 10: Hard Drive Carrier

### 2.3.2 Carrier Bracket

Two carrier brackets are riveted to the chassis front and receive the hard drive carrier. Figure 11 shows an isometric view and three plan views of the carrier bracket

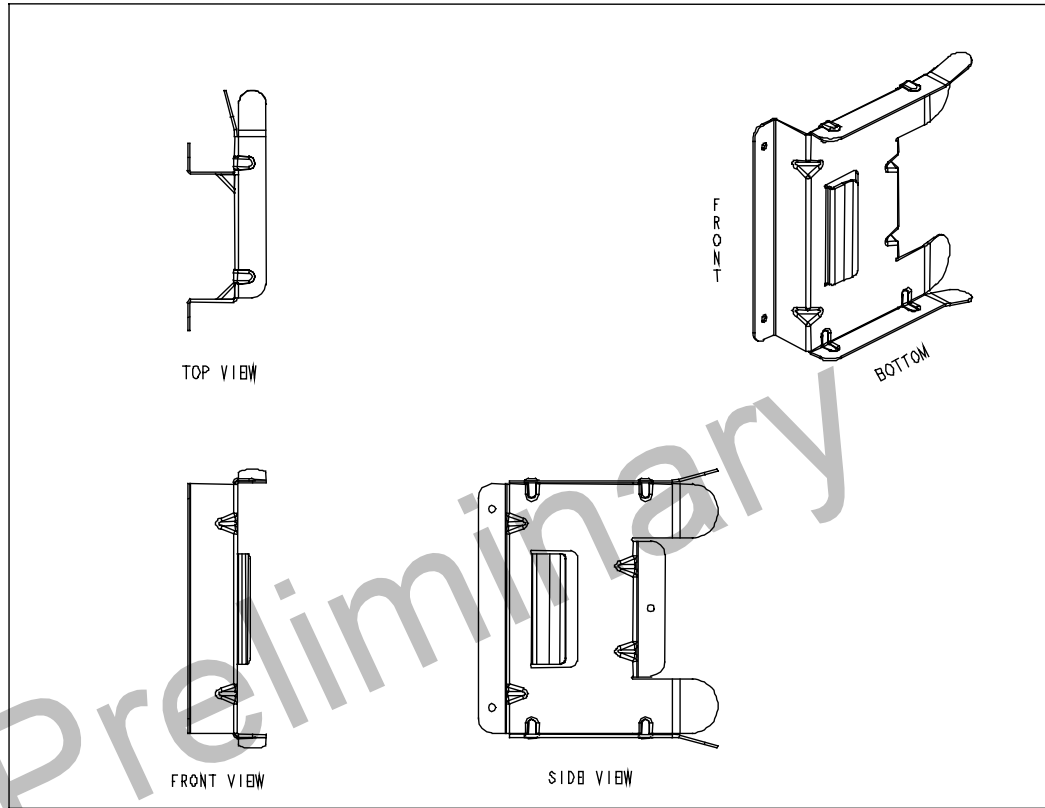


Figure 11: Carrier Bracket

## 2.4 External Drive Assembly

The external drive assembly consists of devices occupying the external bays mounted on a common carrier. This carrier will accommodate three (3) full-height 5¼" devices and one (1) half-height 3½" device. This carrier is not yet designed.

## 2.5 Cosmetic Skins

The cosmetic skins cover the top and both sides of the chassis. Two parts cover these three sides. One part covers the left side and top; it is semi-permanent and is removed only to convert to a rack-mounted system. The other part covers the right side and serves as the system access panel. Figure 12 shows an isometric view of the chassis with the two skins exploded.

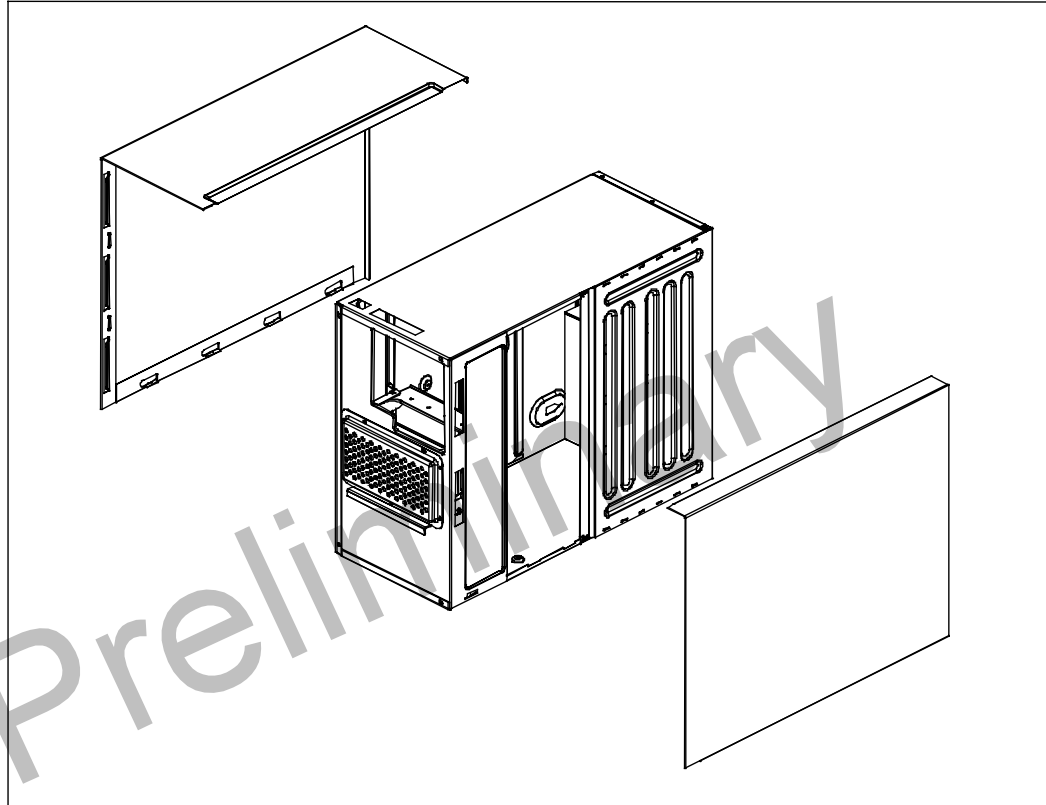


Figure 12: Cosmetic Skins – Exploded

## 3.0 System

The system is the fully functional top-level assembly ready for the end user. This includes the board-set, drives, cables, shields, ground clips, and fasteners. Due to the developmental status of this design, much of this information is not available.

This chapter provides a brief overview of the system concept.

### 3.1 Access

Access to the system components is provided by first removing the right-side access panel shown in Section 2.5. Then the power supply assembly described in Section 2.2 can be swung 95° to the rear. This provides upgrade and service access to most internal components including component boards.

Internal and external drives are both accessed by first removing the bezel, then sliding the appropriate drive carrier forward. The goal is to provide enough cable to allow partial removal of the carrier to add or replace a single drive.

Removing the motherboard requires removing both drive bays, opening the power supply assembly, and de-cabling most if not all components. The adapter plate screw can then be removed, and the board assembly slides forward and lifts out through the right side.

Figure 13 shows the example system opened for access. The right panel and bezel are removed, the power supply assembly is shown rotated 95°, and the drives are shown exploded forward.

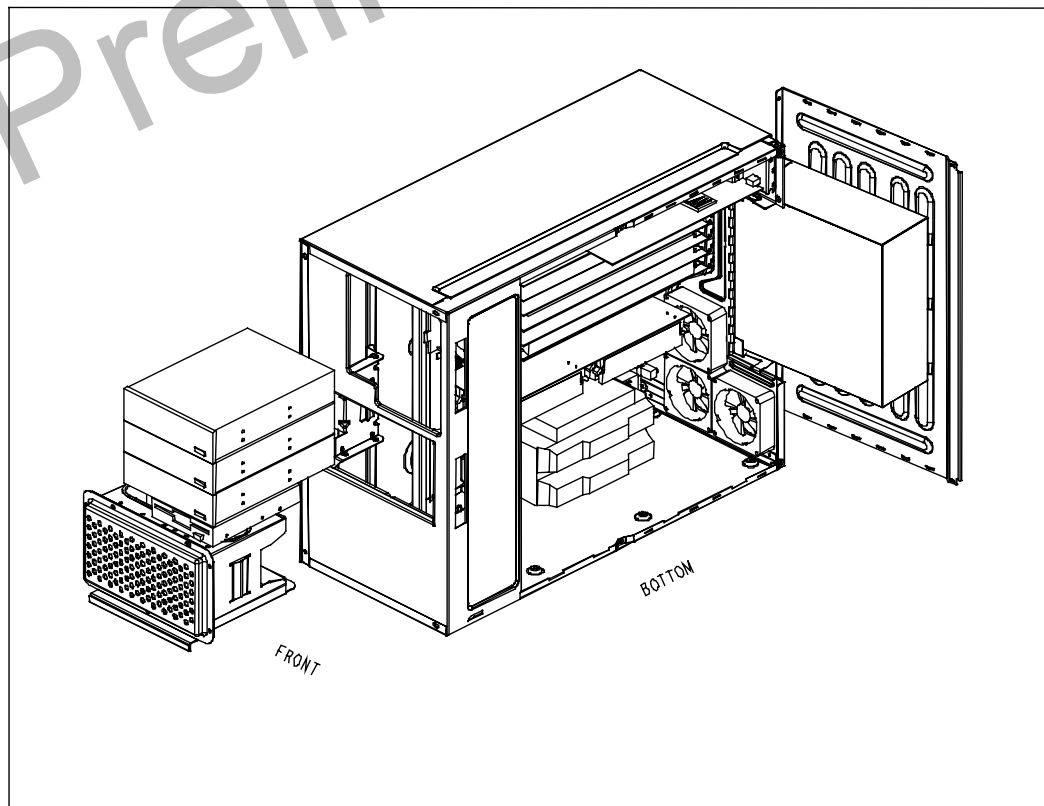


Figure 13: System Access

## 3.2 Board Assembly

The board assembly is the motherboard and adapter plate with all attached components. The attached components do not have to be assembled when the adapter plate is inserted (or removed) into the chassis. Many components such as expansion cards or daughterboards may be added after the motherboard is in place, just as they would be serviced.

The board assembly shown in Figure 14 and throughout this guide is a dual Pentium® II Xeon™ processor motherboard with a memory board, AGP pro, four PCI cards, and a Flex Slot I/O card. The board set is shown slightly exploded from the adapter plate to show detail.

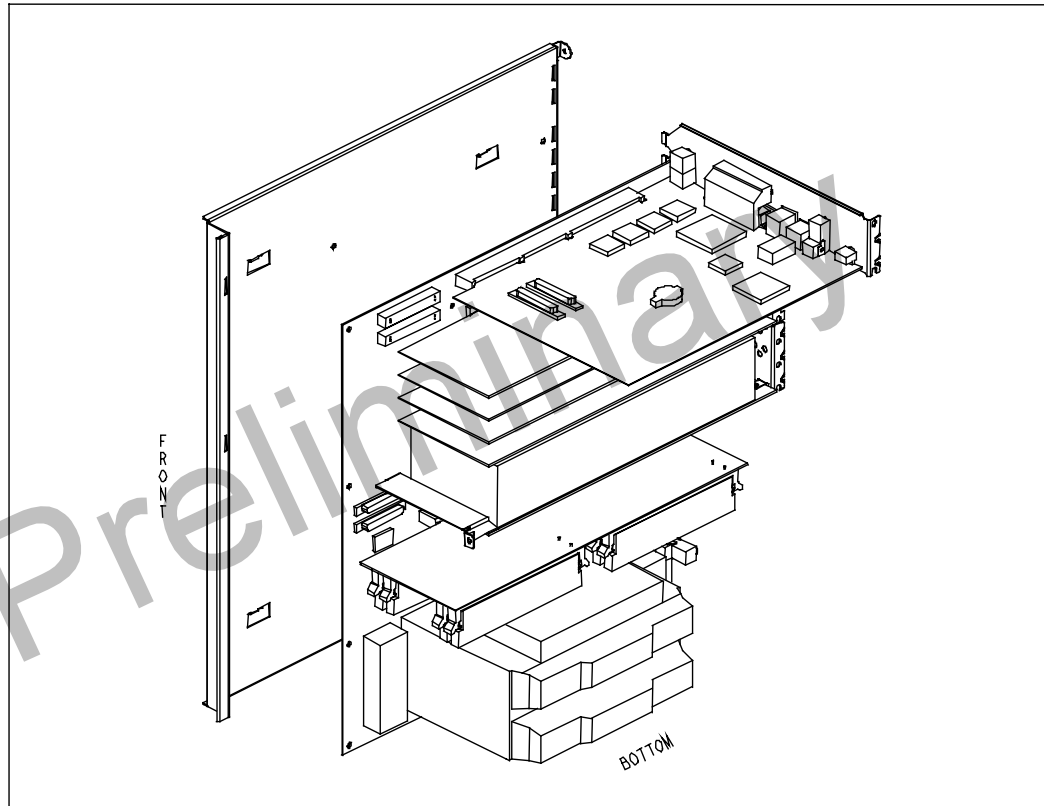


Figure 14: Board Assembly



### 3.2.1 Adapter Plate

The adapter plate provides the common interface between any WTX board-set and any WTX chassis as described in the WTX specification. The adapter plate used for this board-set is currently in the design phase. Figure 15 shows an isometric view and three plan views of the adapter plate in its current state.

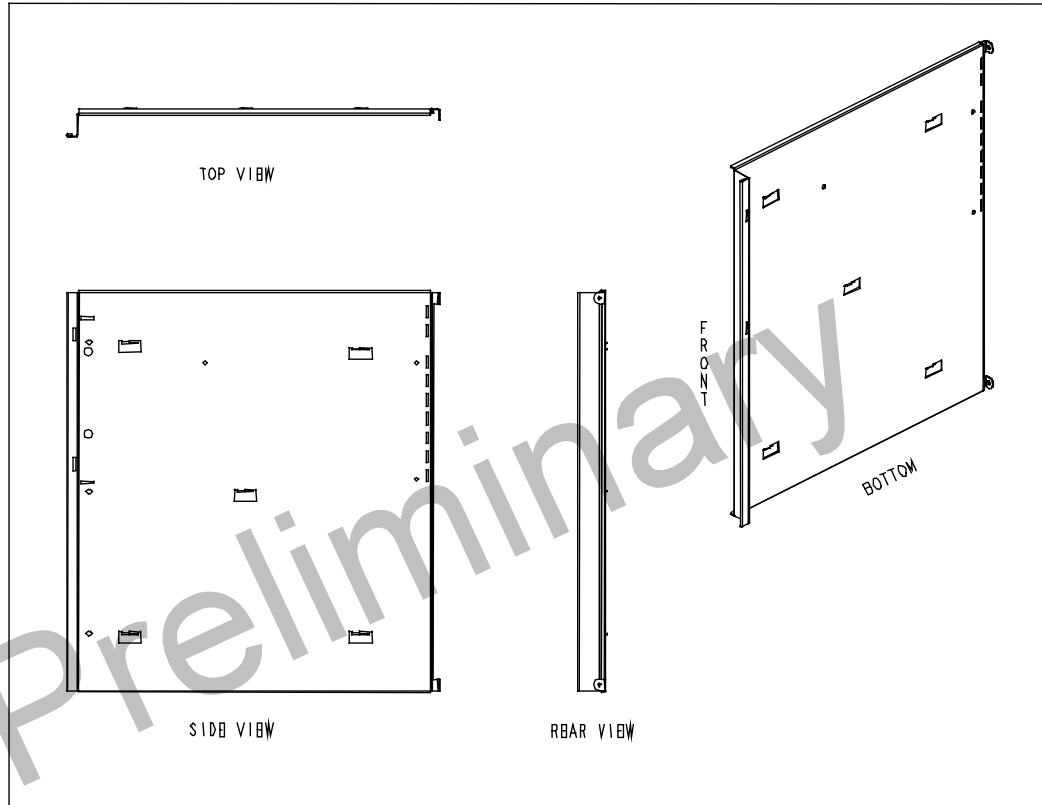


Figure 15: Adapter Plate

### 3.3 System Fans

The system fans provide the required airflow and help establish the thermal zones described in the WTX specification. Figure 16 shows a phantom chassis with a full compliment of fans.

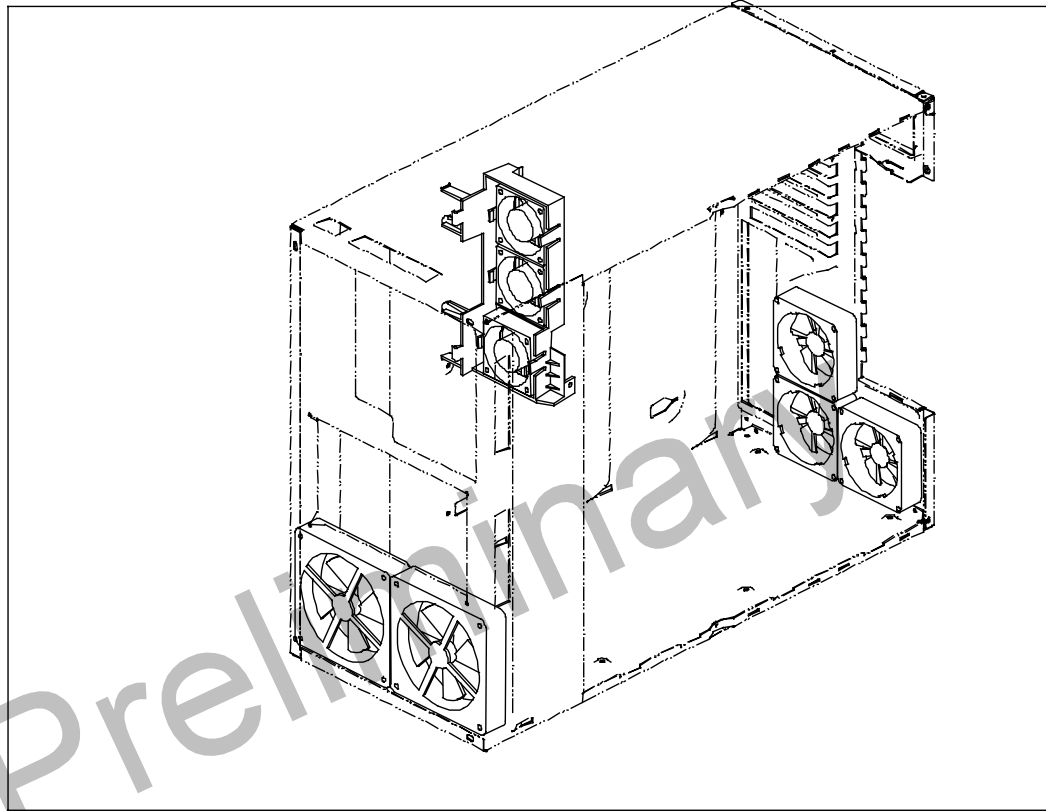


Figure 16: System Fans

The following fan arrangement is used for this system:

- 2 x 120mm front fans to pressurize the system
- 3 x 80mm rear fans to exhaust the system
- 3 x 60mm fans to circulate air over the expansion cards and Flex Slot

Individual configurations may not require maximum system cooling. In such case, fans may be depopulated or derated.